1. A box contains 35 red discs and 5 black discs. A disc is selected at random and its colour noted. The disc is then replaced in the box.

(a) In eight such selections, what is the probability that a black disc is selected

(i) exactly once?

(3)

(ii) at least once?

(3)

(b) The process of selecting and replacing is carried out 400 times.

What is the expected number of black discs that would be drawn?

(2)

(Total 8 marks)

2. A fair coin is tossed eight times. Calculate

(a) the probability of obtaining exactly 4 heads;

(2)

(b) the probability of obtaining exactly 3 heads;

(1)

(c) the probability of obtaining 3, 4 or 5 heads.

(3)

(Total 6 marks)

3. A fair coin is tossed five times. Calculate the probability of obtaining

(a) exactly three heads;

(b) at least one head.

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(Total 6 marks)

4. A factory makes switches. The probability that a switch is defective is 0.04.
The factory tests a random sample of 100 switches.

(a) Find the mean number of defective switches in the sample.

(2)

(b) Find the probability that there are exactly six defective switches in the sample.

(2)

(c) Find the probability that there is at least one defective switch in the sample.

(3)

(Total 7 marks)